REALTIME SYSTEM TESTING

The accuracy of the new real time system (RADAC) must be at least as precise as the existing system. During the performance acceptance testing, any pre-recorded raw input radar, telemetry, or other data should be assumed to be "perfect" (i.e., error free). Any outputs from the new system should be compared to the current RADAC system for accuracy validation. Successful validation should ensure successful performance of the new system.

Front End Testing:

All data formats such as MDDF, LTAS, Ethernet, Telemetry, etc. should be checked for the accuracy of all bits in the bit stream, as well as the accuracy of the decoded data. This can be compared to listings or dumps from the present RADAC system, or from some of our present data reduction programs. Loop-back testing of data formats that should be transmitted shall be checked for accuracy and for inclusion in simulations or debug data testing.

Timing:

Timing should also be a major testing area. Time tags on all incoming data, Wallops Timing System, time tags on all processed data, output and transmitted data will need to be verified for accuracy. Time lags due to processing, software, or hardware will need to be known. Idle time may also be an important factor that will need to be known to allow for any system upgrades.

Setups:

Set-up files will have to be built and checked for content as well as for accuracy. These files will be used in simulations and debug tests of the full system. This task could be quite cumbersome based upon the required number and type of setup files needed to simulate a full mission. The present RADAC system does not allow for much verification of the correctness of data in the setup files. Verifying such things as ranges, limits, etc. of these inputs, if incorporated into the system, could be a time consuming task. Setup files will need to be understood as the system is being designed.

Panels:

Any panels with buttons, either software or manually controlled will have to be checked for proper lighting, execution, and any other control that they may be designated for. Full knowledge of the panels and buttons must be understood in order to perform the system testing and debug.

Graphics:

Any plots, maps, limit lines, nominals, scaling, annotation, etc. will need to be tested for accuracy. Some of the graphics testing can probably be accomplished by matching against the present RADAC system.

Filtering:

Filtering will need to be tested thoroughly for the different types of rockets that are launched, as well as for aircraft type vehicles. Filtering has been one of the main problems with the present RADAC system. Editing, interpolating, extrapolating and filter initializing will all have an impact on the filtering process.

Other areas of testing:

- Transmitting of data for acquisition purposes (accuracy and timing restrictions).
- Recording and archiving.
- Video transmitting to web sites and real time operations.
- Orbit predicts for accuracy and transmission delays.

<u>Lessons Learned</u>:

These will be added to this report in the near future!